



PATENT SPECIFICATION

653,529

Date of filing Complete Specification Jan. 19, 1949

Application Date Jan. 21, 1948.

No. 1805/48.

Complete Specification Published May 16, 1951.

Index at acceptance:—Classes 15(ii), G2; 120(iii), G(1:7c); and 142(iv), K3(a:c:1), K5k.

PROVISIONAL SPECIFICATION

Improvements in or relating to Textile Fabrics

We, JAMES CARGILL SOMERVILLE, of 13, Woodburn Avenue, Kilwinning, Ayrshire, JAMES EMLYN LODWICK THOMAS, of 36, Caledonia Road, Ardrossan, Ayrshire, both British Subjects, and IMPERIAL CHEMICAL INDUSTRIES LIMITED, of Imperial Chemical House, Millbank, London, S.W.1, a British Company, do hereby declare the nature of this invention to be as follows:—

The present invention is concerned with improvements in or relating to textile fabrics.

In a paper entitled "Scaffolding Threads in Yarn and Cloth Structure" by A. Johnson in the Proceedings of "The Journal of the Textile Institute", Dec. 1915, pp. 203, the history of the supporting thread principle is briefly reviewed and then there follows a detailed description of experiments using the alkali-soluble thread, calcium alginate, for the purpose of binding, supporting, carrying embossing, spacing, ornamenting and bonding.

In connection with the use of such alkali-soluble fibre, a process has been disclosed relating to woven, knitted or lace fabrics characterised by producing a fabric, at least in part, from yarn consisting wholly or partially of soluble alginic fibres and thereafter modifying the fabric by dissolving or gelatinising some or all of the alginic fibres. If desired the said yarn consisting partially of soluble alginic fibres can be produced by twisting together soluble alginic fibres and relatively insoluble textile fibres. It is also stated *inter alia* that the said relatively insoluble fibres in the composite yarn thus produced may be substantially untwisted or less twisted than would be necessary to withstand weaving stresses, whereby a softer or more lustrous or stronger fabric is produced.

In Patent Specification No. 584,911 there is described and claimed *inter alia* a process for the production of filaments having an exceptional lack of capacity for transmitting fire by wet spinning a

[Price 2/-]

concentrated syrupy aqueous solution of a water soluble salt of a cellulose hydroxy fatty acid into an aqueous medium containing in solution a salt having an aluminium cation, the said medium being adapted to coagulate the filaments and to replace the cation of the cellulosic salt by aluminium. It is stated in said specification that the resulting filaments swell or dissolve in alkaline solutions.

It has now been ascertained that these aluminium salts of the cellulosic hydroxy fatty acids have a high tensile strength even in fine counts thereby permitting them to be very conveniently used in the existing machinery employed in the manufacture of composite yarns and of textile fabrics.

According to the present invention the process for the production of textile fabrics by producing a fabric at least in part from yarn consisting wholly or partially of alkali-soluble fibres and thereafter modifying the fabric by dissolving or gelatinising some or all of the said alkali-soluble fibres is characterised in that the said alkali soluble fibres consist wholly or in part of an aluminium salt of a cellulose hydroxy fatty acid.

The invention is illustrated by the following examples:—

EXAMPLE I.

A composite yarn is prepared from merino wool of 64s and aluminium carboxy methyl cellulose fibre having a tensile strength of 15 Kg/mm² and prepared according to British Specification No. 584,911. The yarn is treated with 1% ammonium hydroxide solution at 18° C. for five minutes. In this time the aluminium carboxy methyl cellulose fibre is completely dissolved leaving the wool unaffected.

EXAMPLE II.

A yarn is prepared by twisting a fine aluminium carboxy methyl cellulose yarn round a wood roving devoid of twist. A

Price 4s

coherent yarn of good strength is thus produced. This yarn is treated with a 1% sodium carbonate solution at 20° C. for five minutes. In this time the aluminium carboxy methyl cellulose fibre is

completely dissolved leaving the wool unaffected in an untwisted condition.

Dated the 21st day of January, 1948.

E. A. BINGEN,
Solicitor for the Applicants.

COMPLETE SPECIFICATION

Improvements in or relating to Textile Fabrics

We, JAMES CARGILL SOMERVILLE, of 13, Woodburn Avenue, Kilwinning, Ayrshire, JAMES EMLYN LODWICK THOMAS, of 36, Caledonia Road, Ardrossan, Ayrshire, both British Subjects, and IMPERIAL CHEMICAL INDUSTRIES LIMITED, of Imperial Chemical House, Millbank, London, S.W.1, a British Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention is concerned with improvements in or relating to textile fabrics.

In a paper entitled "Scaffolding Threads in Yarn and Cloth Structure" by A. Johnson in the Proceedings of "The Journal of the Textile Institute" Dec. 1945, pp. 203, the history of the supporting thread principle is briefly reviewed and then there follows a detailed description of experiments using the alkali-soluble thread, calcium alginate, for the purpose of binding, supporting, carrying, embossing, spacing, ornamenting and bonding.

In connection with the use of such alkali-soluble fibre, there has been disclosed in Specification No. 550,525 a process for the manufacture of textile fabrics, including woven, knitted or lace fabrics, characterised by producing a fabric, at least in part, from yarn consisting wholly or partially of soluble alginic fibres and thereafter modifying the fabric by dissolving or gelatinising some or all of the alginic fibres. If desired the said yarn consisting partially of soluble alginic fibres can be produced by twisting together soluble alginic fibres and relatively insoluble textile fibres. It is also stated *inter alia* that the said relatively insoluble fibres in the composite yarn thus produced may be substantially untwisted or less twisted than would be necessary to withstand weaving stresses, whereby a softer or more lustrous or stronger fabric is produced.

In Patent Specification No. 584,911 there is described and claimed *inter alia* a process for the production of filaments having an exceptional lack of capacity for transmitting fire by wet spinning a concentrated syrupy aqueous solution of a water soluble salt of a cellulose hydroxy-

fatty acid into an aqueous medium containing in solution a salt having an aluminium cation, the said medium being adapted to coagulate the filaments and to replace the cation of the cellulosic salt by aluminium. It is stated in said Specification that the resulting filaments swell or dissolve in alkaline solutions.

There has been proposed in Specification No. 384,436 a process for the production of textile fabrics exhibiting ornamental effects, comprising subjecting a fabric containing fibres of a cellulose derivative and fibres of other material to the action of a solvent so as to dissolve away the whole of the fibres of such cellulose derivative. The cellulose derivatives disclosed according to this proposal comprised cellulose acetate and other derivatives of cellulose such as organic esters or ethers of cellulose, in particular ethyl cellulose, methyl cellulose and benzyl cellulose, and it was stated that for removing the soluble material any suitable organic solvents might be employed according to the nature of the soluble material.

It has now been ascertained that filaments composed of aluminium salts of the cellulosic hydroxy-fatty acids have a high tensile strength even in fine counts thereby permitting them to be very conveniently used in the existing machinery employed in the manufacture of composite yarns and of textile fabrics.

According to the present invention a process for the production of fabrics composed of a textile fibre material resistant to alkaline solutions of feeble alkalinity wherein there is first formed a textile fabric composed only in part of said resistant textile fibre material and including yarn consisting wholly or in part of fibres of a material soluble in weakly alkaline solutions, and wherein the resulting composite fabric is then treated by dissolving some or all of the fibres of said alkali-soluble material in an alkaline solution of insufficient alkalinity to affect said resistant textile fibre material, thereby to lighten the weight of the fabric and render its texture more open, is characterised in that the fibres soluble in weakly alkaline solutions consist of an aluminium salt of a cellulose hydroxy-fatty acid.

The invention is illustrated by the following examples:—

EXAMPLE I.

The proportion of wool to aluminium carboxy methyl cellulose fibre is 3:1 by weight. The wool fibre is spun to an extremely fine worsted yarn and doubled with a continuous filament yarn of the aluminium carboxy methyl cellulose. The resulting composite yarn is woven into fabric, which is subsequently treated with a 1% ammonium hydroxide solution at 18° C. for five minutes which dissolves out the aluminium carboxy methyl cellulose leaving the very fine spun worsted thread in position in the fabric. In this manner an extremely light weight fabric is woven without difficulty although the worsted yarn is so fine that in the absence of the aluminium carboxymethyl cellulose yarn doubled with it it would be difficult to weave without taking extreme precautions to prevent faults due to breakages, and thus weaving it at an abnormally low rate.

EXAMPLE II.

A composite yarn is produced by twisting together with a counter-clockwise twist a fine aluminium carboxy methyl cellulose yarn with a wool yarn whereof the latter has a clockwise twist of the same number of turns per inch, this has the effect of removing the original twist of the wool yarn and leaving the wool fibres supported by a wrapping of the aluminium carboxy methyl cellulose. The composite yarn is then woven, using it for both warp and weft. The resulting woven fabric is treated with a 1% sodium carbonate solution at 20° C. for five minutes. In this time the aluminium car-

boxy methyl cellulose fibre is completely dissolved out leaving the wool strands in an untwisted condition: the resulting fabric supports itself and has an unusually soft handle and lustrous appearance.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A process for the production of fabrics composed of a textile fibre material resistant to alkaline solutions of feeble alkalinity wherein there is first formed a textile fabric composed only in part of said resistant textile fibre material and including yarn consisting wholly or in part of fibres of a material soluble in weakly alkaline solutions, and wherein the resulting composite fabric is then treated by dissolving some or all of the fibres of said alkali-soluble material in an alkaline solution of insufficient alkalinity to affect said resistant textile fibre material, thereby to lighten the weight of the fabric and render its texture more open, characterised in that the fibres soluble in weakly alkaline solutions consist of an aluminium salt of a cellulose hydroxy-fatty acid.

2. A process for the production of textile fabrics substantially as described with reference to the foregoing examples.

3. Textile fabrics when produced by the process claimed in any of the preceding claims.

Dated this 19th day of January, 1949.

E. A. BINGEN,
Solicitor for the Applicants.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1951.

Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies, price 2s. per copy; by post 2s. 1d. may be obtained.

